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Department of Mechanical Sciences
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Gentlemen:

During the past quarter, Technical Report No. 2 titled, "Free Vibrations of Conical Shells," was submitted. This report covered the theoretical formulation of the titled problem and presented some numerical results retaining only the membrane terms for axisymmetric modes. A condensed version of this report has been submitted to the AIAA Journal for publication. Also, it is understood that the complete report will be reproduced as a NASA Technical Note.

The experimental program for the determination of resonant frequencies and mode shapes for selected truncated conical shell segments is completed. Both free-free and simply supported boundary conditions were maintained. For the simply supported shells the resonant frequencies are predicted well by the shell theory described in Technical Report No. 2 if enough terms are retained in the mode shape expansions. It was found that considerable care must also be taken in properly describing the experimental boundary conditions, with particular regard to the in-plane displacements or stresses. It is not always obvious what these conditions are.

A computer program has not been written as yet for the free-free boundary condition. The difficulty here is that much more complex mode shape expansions are required to obtain accurate results. Otherwise, the formulation of the problem is the same.

During the final quarter, a technical report will be prepared including the correlation between the theoretical and experimental results, both for resonant frequencies and mode shapes.

Dr. Lindholm visited Mr. Howard Wolko at NASA Headquarters on 19 November 1964 to discuss the project activities and present preliminary results.

Respectfully submitted,

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USL/ddn
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